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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,256	10/25/2001	Robert Morena	SP000-253	2368
22928	7590	11/28/2003	EXAMINER	
CORNING INCORPORATED			GREENE, JASON M	
SP-TI-3-1				
CORNING, NY 14831			ART UNIT	PAPER NUMBER
			1724	

DATE MAILED: 11/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

10/045,256

Applicant(s)

MORENA ET AL.

Examiner

Jason M. Greene

Art Unit

1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,7-29 and 31-35 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 1,2,11 and 12 is/are allowed.
6) ☒ Claim(s) 7-10,13-29 and 31-35 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 25 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Response to Arguments

1. Applicant's arguments, see page 8, lines 7-37, filed 08 September, with respect to claims 1 and 2 have been fully considered and are persuasive. The 35 U.S.C. 102(b) rejection of claims 1 and 2 has been withdrawn.
2. Applicant's arguments, see page 8, lines 7 to page 9, line 24, filed 08 September, with respect to claims 11 and 12 have been fully considered and are persuasive. The 35 U.S.C. 103(a) rejection of claims 11 and 12 has been withdrawn.
3. Applicant's arguments filed 08 September 2003 have been fully considered but they are not persuasive.

In response to Applicants' arguments regarding claims 7-10, the Examiner contends that it would have been obvious to one of ordinary skill in the art to form the honeycomb filter of Nishimura utilizing the ceramic of Morena. As noted in the previous action, Morena teaches a ceramic material having a high melting point, high temperature stability, low elastic modulus, and a low coefficient of thermal expansion, in

col. 1, lines 18-29. Additionally, Morena also explicitly teaches the ceramic material being suitable for applications incurring thermal shock in col. 1, lines 27-28. Nishimura teaches a honeycomb filter formed from a ceramic material in col. 4, line 27 to col. 13, line 57. Since the honeycomb filter of Nishimura is used to capture particulate matter contained in an exhaust stream of a diesel engine, one of ordinary skill in the art would clearly recognize that the honeycomb filter will incur thermal shock during operation, especially during regeneration. Therefore, one of ordinary skill in the art would have recognized the desirability of using the thermally stable ceramic material of Morena in producing the honeycomb filter of Nishimura.

In response to Applicants' arguments regarding claims 13, 15, 17-19, 21-25, 27, 29, 31, and 35, Applicants argue that the Morena and Nishimura references do not teach the solvent consisting of the recited emulsion along with one or more of the recited polymers. However, claims 13 and 24, the independent claims, recite the solvent consisting of deionized water, the recited emulsion, or a combination thereof along with one or more of the recited polymers. In other words, claims 13 and 24 do not require the solvent to include the emulsion. Nishimura explicitly discloses a similar method of producing a formable mixture wherein the solvent consists of water and methylcellulose polymer in col. 4, lines 29-62. Therefore, contrary to Applicants' position, Nishimura does disclose the solvent as claimed in claims 13 and 24.

In response to Applicants' arguments regarding claim 32, Bailey discloses a ceramic mixture including a solvent consisting of the recited emulsion of water, triethanolamine, and oleic acid in col. 4, lines 16-19.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morena in view of Nishimura et al.

Morena discloses a ceramic structure comprising a first phase $\text{Cs}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 4\text{SiO}_2$ (CAS_4) and a second phase $\text{Cs}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$ (CAS_2) in col. 1, line 58 to col. 6, line 28. Morena explicitly discloses the ceramic structure including a CAS_4 (pollucite) phase and a CAS_2 phase in col. 3, lines 4-7 and col. 5, lines 2-3.

Morena et al. does not explicitly disclose the ceramic structure having high thermal expansion anisotropy of between 1400-1450 ppm, as calculated from dimensional change $\Delta L/L_0$ over a temperature range from room temperature to 1000 °C, an average coefficient of thermal expansion from room temperature to 1000 °C of about $-10 \times 10^{-7}/^\circ\text{C}$ to $+25 \times 10^{-7}/^\circ\text{C}$ or about $-5 \times 10^{-7}/^\circ\text{C}$ to $+15 \times 10^{-7}/^\circ\text{C}$, or a CAS_4 - CAS_2 I-ratio of about 0.25 to 3.0, 0.5 to 2.0, or 1.0.

However, since the claimed ceramic structure is produced from the same material as the ceramic structure of Morena, the ceramic structure of Morena will inherently exhibit the claimed properties. More specifically, the claimed ceramic structure is disclosed as being formed by reacting a glass frit consisting of 60-68 weight percent Cs_2O , 29-35 weight percent SiO_2 , and optionally 3-5 weight percent Al_2O_3 with an alumina powder in page 7, line 21 to page 8, line 2. Morena discloses the ceramic structure being formed by reacting a glass frit consisting of 65-75 weight percent Cs_2O , 25-35 weight percent SiO_2 , and optionally 1-5 weight percent Al_2O_3 with an alumina powder in col. 3, lines 39-51. Therefore, since the ceramic structures are formed from the same starting material, the final ceramic structures will be identical and will, therefore, have the same $\text{CAS}_4\text{-CAS}_2$ I-ratios and thermal expansion coefficients and will exhibit identical thermal expansion anisotropy.

Morena et al. does not disclose the ceramic structure being a diesel particulate filter wherein the diesel particulate filter comprises a honeycomb body, the honeycomb having an inlet end and an outlet end and a multiplicity of cells extending from the inlet end to the outlet end, the cells having porous walls, wherein part of the total number of cells at the inlet end are plugged along a portion of their lengths, and the remaining part of cells that are open at the inlet end are plugged at the outlet end along a portion of the lengths, so that an engine exhaust stream passing through the cells of the honeycomb from the inlet end to the outlet end flows into the open cells, through the cell walls, and out of the structure through the open sells at the outlet end.

Nishimura discloses a similar ceramic structure formed as a diesel particulate filter wherein the diesel particulate filter comprises a honeycomb body, the honeycomb having an inlet end and an outlet end and a multiplicity of cells extending from the inlet end to the outlet end, the cells having porous walls, wherein part of the total number of cells at the inlet end are plugged along a portion of their lengths, and the remaining part of cells that are open at the inlet end are plugged at the outlet end along a portion of the lengths, so that an engine exhaust stream passing through the cells of the honeycomb from the inlet end to the outlet end flows into the open cells, through the cell walls, and out of the structure through the open sells at the outlet end in col. 4, line 27 to col. 13, line 57.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ceramic of Morena into the honeycomb structure of Nishimura to allow the diesel particulate filter to be formed from a ceramic material having a high melting point, high temperature stability, low elastic modulus, and a low coefficient of thermal expansion, as suggested by Morena in col. 1, lines 18-29.

6. Claims 13, 15, 17-19, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morena in view of Nishimura et al.

With regard to claims 13, 15, 18, 19, and 21-23, Morena discloses a method of producing a formable mixture comprising combining a dry blend material consisting essentially of 65-90 percent by weight of a glass frit and 10-35 percent by weight Al_2O_3 ,

wherein the glass frit consists essentially of, expressed in weight percent on an oxide basis, 65-75 percent Cs_2O , 25-35 percent SiO_2 , and optionally 1-5 percent Al_2O_3 with an organic binder in col. 1, line 58 to col. 6, line 28.

Morena et al. does not disclose the formable mixture including a solvent selected from the group consisting of deionized water, an emulsion consisting essentially of about 95 weight percent deionized water, about 0.7 weight percent triethanolamine, and about 4.3 weight percent oleic acid, and combinations thereof, or a polymer selected from the group consisting of crosslinked polyacrylic acid copolymer, a polyethylene oxide polymer, and combinations thereof.

Nishimura et al. discloses a similar method of producing a formable mixture comprising combining a dry blend ceramic material, a solvent comprising water, and methylcellulose polymer, wherein the formable mixture is extruded into a monolithic honeycomb structure in col. 4, lines 29-62.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the water solvent and methylcellulose polymer of Nishimura et al. into the dry blend material of Morena to produce a formable mixture capable of being extruded into a honeycomb filter.

While Nishimura et al. does not explicitly disclose the water being deionized water, one of ordinary skill in the art would recognize the need to use deionized water to avoid introducing foreign contaminants into the formable mixture.

With regard to claim 17, Morena discloses the glass frit optionally including a low proportion of alkaline earth metal oxides, such as strontium oxide (SrO), in col. 4, lines 11-20. Since the alkaline earth metals are limited to beryllium, magnesium, calcium, strontium, barium, and radium, one of ordinary skill in the art would at once envisage the alkaline earth metal oxides including strontium oxide.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morena and Nishimura et al. as applied to claim 13 above, and further in view of Quadir et al.

Morena and Nishimura et al. do not disclose the polymer being a crosslinked polyacrylic acid copolymer.

Quadir et al. discloses a similar formable mixture wherein the polymer is a crosslinked polyacrylic acid copolymer in col. 2, lines 21-61.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the crosslinked polyacrylic acid copolymer for the methylcellulose polymer of Morena and Nishimura et al. in that such are alternate polymers in the art for producing a formable ceramic mixture, mere substitution of one known formable mixture producing polymer for another in the art being within the scope of one having ordinary skill in the art.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morena and Nishimura et al. as applied to claim 13 above, and further in view of Mori et al.

Morena and Nishimura et al. do not disclose up to 2 percent by weight of Li_2O being substituted for Cs_2O .

Mori et al. discloses a similar formable mixture wherein 2 mole percent (0.2 weight percent) of Li_2O is substituted for Cs_2O in col. 3, lines 33-49.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Li_2O of Mori et al. into the formable mixture of Morena and Nishimura et al. to maintain the low thermal expansion property of the ceramic within a range from room temperature to a temperature exceeding 1000°C , as suggested by Mori et al. in col. 3, lines 33-39.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morena and Nishimura et al. as applied to claim 19 above, and further in view of Bailey.

Nishimura et al. discloses the solvent being an emulsion consisting essentially of about 95 percent (93 weight percent) water and about 5 weight percent (7 weight percent) stearic acid, wherein the stearic acid serves as a lubricant in col. 10, lines 1-4.

Morena and Nishimura et al. do not disclose the solvent being an emulsion consisting essentially of about 95 weight percent deionized water, about 0.7 weight percent triethanolamine, and about 4.3 weight percent oleic acid.

Bailey discloses a ceramic mixture including an emulsion of water, triethanolamine, and oleic acid in col. 4, lines 16-19.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the triethanolamine and oleic acid lubricants of Bailey

for the stearic acid lubricant of Morena and Nishimura et al. in that such are alternate lubricants in the art for producing a formable ceramic mixture, mere substitution of one known lubricant for another in the art being within the scope of one having ordinary skill in the art.

While Bailey does not disclose the specific ratio of triethanolamine to oleic acid, one of ordinary skill in the art at the time the invention was made would have recognized that the ratio could have been varied to provide a formable mixture having desired flow properties for a particular application.

10. Claims 24, 25, 27, 29, 31, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morena in view of Nishimura et al.

With regard to claims 24, 25, 31, 34, and 35, Morena discloses a method of making a monolithic structure for high temperature applications comprising forming a mixture comprising 95 percent, by weight, of a dry blend consisting essentially of 65-90 percent by weight of a glass frit consisting essentially of, expressed in weight percent on an oxide basis, 65-75 percent Cs_2O , 25-35 percent SiO_2 , and optionally 1-5 percent Al_2O_3 , and 10-35 percent by weight Al_2O_3 , about 5 percent by weight of an organic binder, and 0 weight percent of a pore former, shaping the mixture to form a green body, and firing the green body in an electric furnace at a temperature of about 1550 °C over a period of about 12 hours, and held at a maximum temperature for about 4 hours (2 hours) in col. 1, line 58 to col. 6, line 28.

Morena does not disclose the mixture including 15-30 weight percent of a selected from the group consisting of deionized water, an emulsion consisting essentially of about 95 weight percent deionized water, about 0.7 weight percent triethanolamine, and about 4.3 weight percent oleic acid, and combinations thereof, or the polymer being selected from the group consisting of crosslinked polyacrylic acid copolymer, a polyethylene oxide polymer, and combinations thereof.

Nishimura et al. discloses a similar method wherein the mixture includes 70 weight percent (100 parts out of 142 parts total) of a dry blend and 19 weight percent of a solvent consisting of water, wherein the polymer is methylcellulose, and wherein the mixture is shaped by extrusion into a honeycomb structure having an inlet end and an outlet end and a multiplicity of cells extending from the inlet end to the outlet end, the cells having porous walls and every other cell being plugged to form a wall-flow filter in col. 4, lines 27-63 and col. 9, line 65 to col. 10, line 14.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the solvent and methylcellulose polymer of Nishimura et al. into the mixture of Morena to produce a formable mixture capable of being extruded into a honeycomb filter.

While Nishimura et al. does not explicitly disclose the water being deionized water, one of ordinary skill in the art would recognize the need to use deionized water to avoid introducing foreign contaminants into the formable mixture.

With regard to claim 27, Morena discloses the polymer being added at about 5 percent by weight in col. 4, lines 57-61. The range of about 5 weight percent is seen as lying within the claimed range of 0.1-4 weight percent.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the proportion of the polymer in the mixture to provide a formable mixture having desired flow properties for a particular application.

With regard to claim 29, Morena discloses the glass frit optionally including a low proportion of alkaline earth metal oxides, such as strontium oxide (SrO), in col. 4, lines 11-20. Since the alkaline earth metals are limited to beryllium, magnesium, calcium, strontium, barium, and radium, one of ordinary skill in the art would at once envisage the alkaline earth metal oxides including strontium oxide.

11. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morena and Nishimura et al. as applied to claim 24 above, and further in view of Mori et al.

Morena and Nishimura et al. do not disclose up to 2 percent by weight of Li_2O being substituted for Cs_2O .

Mori et al. discloses a similar mixture wherein 2 mole percent (0.2 weight percent) of Li_2O is substituted for Cs_2O in col. 3, lines 33-49.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Li_2O of Mori et al. into the mixture of Morena and Nishimura et al. to maintain the low thermal expansion property of the ceramic within a

range from room temperature to a temperature exceeding 1000 °C, as suggested by Mori et al. in col. 3, lines 33-39.

12. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morena and Nishimura et al. as applied to claim 27 above, and further in view of Quadir et al.

Morena and Nishimura et al. do not disclose the polymer being a crosslinked polyacrylic acid copolymer.

Quadir et al. discloses a similar mixture wherein the polymer is a crosslinked polyacrylic acid copolymer in col. 2, lines 21-61.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the crosslinked polyacrylic acid copolymer for the methylcellulose polymer of Morena and Nishimura et al. in that such are alternate polymers in the art for producing a formable ceramic mixture, mere substitution of one known formable mixture producing polymer for another in the art being within the scope of one having ordinary skill in the art.

13. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morena and Nishimura et al. as applied to claim 24 above, and further in view of Bailey.

Nishimura et al. discloses the solvent being an emulsion consisting essentially of about 95 percent (93 weight percent) water and about 5 weight percent (7 weight percent) stearic acid, wherein the stearic acid serves as a lubricant in col. 10, lines 1-4.

Morena and Nishimura et al. do not disclose the solvent being an emulsion consisting essentially of about 95 weight percent deionized water, about 0.7 weight percent triethanolamine, and about 4.3 weight percent oleic acid.

Bailey discloses a ceramic mixture including an emulsion of water, triethanolamine, and oleic acid in col. 4, lines 16-19.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the triethanolamine and oleic acid lubricants of Bailey for the stearic acid lubricant of Morena and Nishimura et al. in that such are alternate lubricants in the art for producing a formable ceramic mixture, mere substitution of one known lubricant for another in the art being within the scope of one having ordinary skill in the art.

While Bailey does not disclose the specific ratio of triethanolamine to oleic acid, one of ordinary skill in the art at the time the invention was made would have recognized that the ratio could have been varied to provide a formable mixture having desired flow properties for a particular application.

14. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morena and Nishimura et al. as applied to claim 24 above, and further in view of Kasai et al.

Morena and Nishimura et al. do not disclose the pre former being graphite.

Kasai et al. discloses using graphite as a pore former in col. 5, lines 56-66.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the graphite pore formed of Kasai et al. for the pore

former of Morena and Nishimura et al. in that such are alternate pore formers in the art for producing porous ceramics, mere substitution of one pore former for another in the art being within the scope of one having ordinary skill in the art.

Allowable Subject Matter

15. Claims 1, 2, 11, and 12 are allowed.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (703) 308-6240. The examiner can normally be reached on Tuesday - Friday (7:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (703) 308-1261. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310.

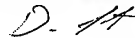
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jason M. Greene
Examiner
Art Unit 1724



jmg
November 19, 2003

DUANE SMITH
PRIMARY EXAMINER


11-121-07